NOTE BY THE EDITOR.—As it has been objected that, in the equation we gave, on page 143, (No. 5) of the parallel curve to an ellipse, our result was not satisfactory because the equation involved explicitly only one of the coordinates; we therefore add, as a supplement to that note, the following:

By similar triangles (see fig. on p. 143) we have

$$y - y' : x - x' :: y : ON'. \quad . \; . \; . \; . \; . \quad (1')$$

Also, from the differential triangle,

$$(dx^2 + dy^2)^{\frac{1}{2}} : dy :: N : ON' \quad . \; . \; . \; . \; . \quad (2')$$

From $(1')$ and $(2')$ we get

$$N = \frac{(x - x')y}{y - y'}\sqrt{\left(1 + \frac{dx^2}{dy^2}\right)} = \frac{(x - x')y}{y - y'}\sqrt{\left(1 + \frac{a^4 - a^2x^2}{b^2x^2}\right)}.$$

Writing $q$ for $N' \div (N' + c)$, we get by reduction,

$$x' = x - \frac{N(1 - q)bx}{\sqrt{[a^4 - (a^2 - b^2)x^2]}}.$$

Substituting for $y$, in the equation of the ellipse, its value from (2), (p. 143) we have $x = \frac{a}{b}\sqrt{\left(b^2 - q^2y'^2\right)}$; and putting this value of $x$ for $x$, in the last equation above, and for $N'$, as involved in $q$, and $N$, their values in functions of $y'$ from the equation given on page 143, we obtain an equation involving only as variables the coordinates $x'$ and $y'$.

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## PROBLEMS.

92. BY A. W. MASON, CEDAR FALLS, IOWA.—A balloon is ascending vertically with a given velocity $v$, and a body is let fall from it, which touches the ground in $t$ seconds; find the height of the balloon at the moment the body is let fall fron it.

93. BY PROF. J. SCHEFFER.—To construct a triangle if the three radii of the circles, which touch the three sides externally, be given.

94. BY PROF. W. W. JOHNSON.— One side of a quadrilateral, whose four sides are given in length, is fixed: find the equation of the locus of the middle point of the opposite side, in rectangular coordinates.

95. BY DR. A. B. NELSON, DANVILLE, KY. — Prove, otherwise than by the Integral Calculus that

$$\frac{\pi}{2} - \sin^{-1}e = 2\tan^{-1}\left(\frac{1 - e}{1 + e}\right)^{\frac{1}{2}}.$$